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ABSTRACT

This study examined the effects of full-day kindergarten on students' development of literacy skills as measured by Clay's Observation Survey, focusing on the impact for Canadian schools serving students from low socioeconomic or educationally deprived backgrounds. Data were collected from two schools offering full-day programs and one school offering half-day kindergarten to students in two classes. The schools offering full-day programs served similar, diverse, low socioeconomic status inner city populations. The school with half-day kindergarten served children of various ethnic backgrounds with a broad range of socioeconomic needs and was located in a suburban area. Data sources included semi-structured interviews with kindergarten teachers near the end of the academic year and a pre-post assessment of students' literacy skills. Analyses of the interviews involved the use of narrative accounts to support emerging themes regarding the beliefs held by participant teachers and their emphases in the four classrooms. Findings indicated that both schools offering full-time kindergarten had a literacy and numeracy emphasis at the center of their mandates. The school offering half-day kindergarten supported a theme-based balanced literacy approach with activity centers structured to reinforce the themes being addressed. All four teachers shared similar views and beliefs about how best to teach children. Students in the full-day program experienced significantly greater growth in the prerequisite skills for reading than children in the half-day program, after taking into account previous ability, age, and gender. Findings led to recommendations regarding further research and educational policy. (Contains 13 references.) (KB)

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A Comparison of the Literacy Effects of Full Day vs. Half-day Kindergarten

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A Comparison of the Literacy Effects of Full Day vs. Half-day Kindergarten

Existing Research and Literature

Considerable research has been conducted into kindergarten programs both nationally and internationally (e.g., Corter & Park,1993; Fusaro, 1997; Housden & Rose, 1992; Ohio State Legislative Office of Education Oversight, 1997; Rothenberg, 1995; Sergesketter & Gilman, 1988). The focus of the reported research has been primarily on kindergarten curricula and on student time spent in kindergarten. In a review of the literature, Corter and Park (1993) found agreement among the teachers, principals, consultants, and parents regarding what constituted exemplary kindergarten practices. They noted six principles, namely:

1. underpinning the kindergarten program of studies should be a play-based child-centred philosophy;
2. the focus of the program should be on the *whole* child;
3. the child should be placed in the social context;
4. parents and administrators should recognize and support the teacher;
5. all interest groups should work towards structured and balanced programs; and
6. schools and society in general should provide support for kindergarten.

No mention was made by Corter and Park (1993) regarding instructional time in kindergarten. Along the same vein, Meyer et al. (1985) argued that for the purpose of developing student literacy it is crucial to systematically study not only what and how programs are implemented, but also to examine "the long-term effects of various kindergarten programs with an academic focus versus programs that are individualized for teachers and students.

The literature reports many reasons for varying the length of the school day for kindergarten children. In support of full-day programs, the reasons range from "eliminating the need to provide buses and crossing guards at mid-day" (Rothenberg, 1995), to "providing an academic advantage to all students (Ohio State Legislative Office of Education Oversight, 1997). A review of the literature does, generally, support the notion that full-day kindergarten provides an academic advantage for students. In a recent study of 77 children in East Brunswick Public School District in New Jersey, Alber-Kelsay (1998) found that those grade one children who had attended full-day kindergarten scored higher than their half-day counterparts as measured on all areas of the standardized portfolio assessment measuring instrument. Furthermore, these students performed particularly well on the Developmental Spelling Assessment sub-test of the standardized portfolio. In another longitudinal study spanning three years, Koopmans (1991) found that the long-term effect of attending an all-day kindergarten program provided grade one students with a significant academic advantage over their counterparts who attended half-day kindergarten. These results are supported by Fusaro's (1997) meta-analysis of kindergarten research which found that "overall, students who attended full-day kindergarten manifested significantly greater achievement than half-day attendees.

Some debate does appear in the literature regarding who might best benefit from full-day kindergarten. Housden and Kam (1992) and Fromboluti (1988) both argue that a developmentally appropriate full-day kindergarten program benefits all children both academically and socially, but it is especially beneficial to children from low socioeconomic or educationally disadvantaged backgrounds.

Purpose of the Research

In Canada, presently, there are a variety of models being used for delivery of kindergarten curricula. School jurisdictions in most Canadian provinces and the territories make available to kindergarten age children a minimum of half-day programs. Quebec and New Brunswick both require school jurisdictions to offer kindergarten age children full-time, full-day programs. In Alberta, teacher-student contact ranges from four half-day sessions per week to two full day sessions per week to five full-day sessions per week. However, more often than not, during the 1999/2000 school year Alberta schools offered kindergarten students 400 contact hours per year maximum. This funded maximum was increased to 475 hours by Alberta Learning effective for the 2000/01 school year. Standing out, in terms of the number of student-teacher contact hours, from other kindergarten programs in Alberta is the program offered at two inner city elementary schools. These schools, each through the generosity of anonymous benefactors, have been able to offer their kindergarten students a full-day program with approximately 1000 instructional hours per year.

The present research was situated primarily with those studies focussing on the effects of time spent in face-to-face interaction in the kindergarten classroom, particularly with respect to the development of literacy skills in kindergarten students. The present study addressed the question: What are the effects of full-day Kindergarten on students' development in the foundational area of literacy development as measured by Clay's Observation Survey sub-scales. Overall, this study provides a glimpse into the acquisition of basic literacy skills potential of full-day kindergarten in schools serving students from low socioeconomic or educationally deprived backgrounds.

Method

This research drew on two research methodologies – a Positivist one and, to a lesser extent, a Constructivist one. This study made use of several data sources, including: (a) quantitative data collected by the participant schools for assessing student progress, and (b) semi-structured interviews with kindergarten school staff. The analysis of the quantitative data conformed to the causal-comparative research approach (Gall, Borg, & Gall, 1996). The qualitative data served only to provide a context for the quantitative data.

Respondent Group and Data Sources

The data for this study were collected in two ways from two schools – Falcon Elementary School and Eagle Elementary Schools (both pseudonyms) – offering full-day kindergarten programs and one school – Hawk Elementary School (a pseudonym) – offering half-day kindergarten programs to pupils in two classes. Both Falcon and Eagle Elementary Schools (both with student enrolments of fewer than 200) serve similar, diverse, low socio-economic status inner city populations. Hawk Elementary School (with a student enrolment of just under 500) serves students from a wide socio-economic and multicultural spectrum with approximately one-third of students speaking a language other than English at home. Interview data were gathered through semi-structured interviews near the end of the 1999/2000 school year with the full-day kindergarten teachers at Falcon Elementary School and Eagle Elementary Schools. Interview data were also collected from the two half-day kindergarten teachers at Hawk Elementary School near the end of the 1999/2000 school year.

Student data collected using six of Clay's (1993) Observation Survey sub-tests comprised the quantitative portion of the study. Clay's Observation Survey sub-test data were collected by an ECS district consultant in early October of 1999 – pre-test data – and then again in June of 2000 – post-test data – of the 1999/2000 school year at Eagle Elementary School (n = 17), Falcon Elementary School (n = 15), and at Hawk Elementary School (n = 41). Only data collected from students who were present for both the pre- and post-tests were analysed. Throughout the school year, although kindergarten enrolments remained relatively steady, 2 students were lost from Eagle Elementary School, 1 student was lost from Falcon Elementary School, and 6 students were lost from Hawk Elementary School. Data collection procedures ensured that the number of instructional days elapsing between the gathering of pre-test and post-test data were approximately the same – within five percent – for the full-day and the half-day kindergarten programs.

Clay's Observation Survey

The Clay (1993) Observation Survey is an internationally recognized instrument for assessing the development of non-readers and emergent-readers. This survey places emphasis on the operations and strategies used by emergent readers to obtain messages from text and to place messages into text. The six Observation Survey sub-scales used in the present study were: (a) Letter Identification (split-half r = 0.97, validity–correlation with Word reading r = 0.85), (b) Concepts About Print (test-retest r = 0.73 to 0.95, validity–correlation with Word reading r = 0.79), (c) Ready to Read Word Test (split-half r = 0.90, validity–correlation with Word reading r = 0.90), (d) Writing Vocabulary (split-half r = 0.97, validity–correlation with Word reading r = 0.82), (e) Hearing and Recording Sounds in Words (split- half r = NA, validity–correlation with Word reading r = NA), and (f) Book Reading Level (split-half r = NA, validity–correlation with Word reading r = NA).

The letter identification sub-scale of Clay's Observation Survey assesses the extent to which a reader recognizes upper and lower case letters in Times Roman and Century Gothic type fonts. Readers are presented with a single sheet containing (a) all of the letters of the alphabet in upper and lower case using a Times Roman font and (b) the lower case letters "a" and "g" in Century Gothic font. The reader is asked to read the letters, which are presented in random order, by the teacher or researcher. A reader who is unable to identify particular letters is asked one or more of a series of questions to help the child recall, these include: (a) Do you know its name? (b) What sound does it make? and (c) Do you know a word that starts like that?

Clay's concepts about print sub-scale assesses the extent to which emergent readers understand how Western languages are printed. The concepts that are assessed include identifying

> the front of the book; that print (not the picture) tells the story; that there are letters, and clusters of letters called words; that there are first letters and last letters in words; that you [sic] can choose upper or lower case letters; that spaces are there for a reason; and that different punctuation marks have meanings (fullstop, question mark, talking marks). (Clay, 1993, p. 47)

The Ready to Read Word test, as devised by Clay (1993), is "compiled from high frequency words in reading materials that are adopted" (p. 53) by the teacher for use in the

classroom. This allows the assessment to be based on words that the child has had an opportunity to learn. In the present context, this test allows teachers and researchers to assess student knowledge of words which are consistent with learning objectives specified in the Alberta recommended curriculum for kindergarten. In Alberta, these words are consistent with the "primer" series of the Dolch Word List.

Clay's writing vocabulary sub-test enables teachers or researchers to systematically assess children's writing behaviour. Observation of writing vocabulary provides a good indication of emergent readers' "knowledge of letter and of the left-to-right sequencing behaviour required to read English. Components of writing vocabulary which were examined include: (a) letter formation, (b) the variety of letter forms used, (c) the number of words which can be drawn upon from memory, and (d) the ability to correctly sequence letters to spell the words drawn upon from memory.

The hearing and recording sounds in words sub-test has the emergent reader record a dictated sentence. This dictation is then "scored by counting the child's representation of the sounds (phonemes) by letters (graphemes)" (Clay, 1993, p. 65), spelling is not assessed in this sub-test. The hearing and recording sounds in words sub-test assesses the extent to which emergent readers are able to: (a) hear the sounds entombed within words, (b) discriminate visually among symbols used in print, (c) sequence individual symbols and groups of symbols to represent sounds, and (d) identify "that there are many alternatives and exceptions in our system of putting sounds into print" (Clay, 1993, p. 65).

Emergent readers' book reading level is determined by a running record (or miscue analysis) of the child's reading of a series of levelled books. The child is considered to be reading at a particular level if he or she can read books from that level with 90 percent or higher rate of accuracy. Testing proceeds until a child reaches a "hard" level or a "frustration" level in which reading word accuracy diminishes to below 90 percent.

Data Analysis

Using Analysis of Covariance tests (ANCOVA), to adjust the post-test data for prior knowledge, as measured by the pre-test data, students in the full-day kindergarten program were compared with data collected from students in the half-day kindergarten program. Six univariate ANCOVAs corresponding to each of Clay's five Observation Survey sub-tests and the emergent readers' Book Reading Level were conducted to compare the two kindergarten programs.

The alpha level was set to 0.05 for all comparisons. Although a less conservative alpha level would have been appropriate (see Pedhazur, 1982), the more stringent level was used to reduce the possibility of a Type II error when making inferences back to the population.

The analyses of the semi-structured interviews were conducted through the use of narrative accounts to support emerging themes. These data serve to provide an overview of the beliefs held by the participant teachers and their emphases in the four kindergarten classrooms.

Findings

School Contexts

Eagle Elementary School and Falcon Elementary School. Both of the schools offering full-day kindergarten programs each had total student enrolments of fewer than 200 and catered to pupils of various ethnic backgrounds in kindergarten to grade six. Both schools are located in the inner city area of a large Western Canadian metropolitan area. Relative to other schools in the district, both of these schools serve a high socio-economic needs community and ranked among the top 5% of the neediest schools in the district during the 1999/2000 school year. Fifty-three percent of households sending children to Fox Elementary School earned less than $15,000 in 1991 (the most recent economic data collected by the District). Almost one-third of the students attending Eagle Elementary School and half of the students attending Falcon Elementary School have special needs designations. The demographic profile of the local community shows high proportions of single adult households and single males. Many individuals and families living in the schools' catchment area are transient resulting in a high turn-over rate of the student population at Fox Elementary – ranging from 20% to 30% per year over the past 10 years.

All children at Eagle Elementary School and at Falcon Elementary School are provided with snacks and a hot lunch program. It is believed by all staff at both these schools that learning can only take place once this most basic need has been met.

Both schools have a literacy and numeracy emphasis at the centre of their mandates. Both schools have put into place various partnership strategies among parents, school, and community to benefit student learning. At Falcon Elementary School children in the kindergarten program are teamed with children from other grades in the school for the purpose of reading together. All kindergarten children at Falcon Elementary School were also paired with adult mentors who came into the school for between 30 minutes and two hours per week. These mentors typically engaged in activities that were literacy based. An experienced half-time teacher assistant also assisted kindergarten students at Falcon Elementary School. At Eagle Elementary School, kindergarten students also partner with children from other grades in the school for the purpose of reading together. The teacher at Eagle Elementary School did not have a teacher assistant helping in her classroom.

Hawk Elementary School. Hawk Elementary School caters to slightly under 500 pupils of various ethnic backgrounds in kindergarten to grade six and is located in a suburban area of a large Western Canadian metropolitan area. Hawk Elementary serves families in the local community having a broad range of socio-economic needs. Approximately one-third of the students attending Hawk Elementary School come from homes in which English is not spoken.

> The school's philosophy states:
> . . . we believe that learning is a life-long process in which the school, the parents and the community need to work in partnership to ensure the development of responsible citizens. We believe that all students are capable of learning and need to be challenged at their own level, with a focus on personal growth and achievement. We believe in providing a safe and caring environment by establishing specific expectations for learning and behaviour.

Furthermore, the school has also mandated a focus on early literacy for its students. The school uses a Balanced Literacy strategy in all of its classrooms from kindergarten to grade six. Each of the kindergarten classrooms participating in this study had the benefit of having a teacher aide from the beginning of the school year until early March. One of these two classrooms also had a teacher aide present during the last month of the school year. Both kindergarten classrooms had parent volunteers who came into the classroom on a regular basis to help work with the children.

Activities in the Hawk Elementary kindergarten program were thematically based and supported "balanced literacy" – a focus taken by the school as a whole. Activity centres are structured to reinforce the themes being addressed. Themes are selected by the teachers with the needs of the children in mind. The expectation was that the themes selected would impart excitement and curiosity in the children.

The Teachers

The teachers at Falcon Elementary and Eagle Elementary schools were remarkably similar in terms of professional teaching experience. The teachers at Hawk Elementary school differed from the other two in terms of teaching experience – one was a very seasoned teacher while the second was relatively new to the teaching profession. All four teachers shared similar views and beliefs about how best to teach children. When asked about what they perceived to be the effects of their kindergarten programs on the children in the areas of play, problem solving, social growth, and emotional growth, all responded in remarkably similar ways. To monitor student growth both teachers indicated that they use ongoing observation and checklists corresponding to the Alberta Education recommended kindergarten curriculum. Anecdotal comments from their observations and examples of students' work are kept in student portfolios by all four of the teachers.

The Falcon Elementary teacher. Cathy (a pseudonym) started teaching at Falcon Elementary school in the 1998/99 school year. Including the 1999/2000 school year, she had taught for a total of 12 years, all within the same district. Ten of those years had been spent at one other elementary school teaching kindergarten. Cathy did have a brief hiatus from teaching when her daughter, presently in elementary school, was born. She has considerable experience with young children at both professional and personal levels. Cathy was brought to Falcon Elementary by the principal because, as the principal stated, "she is one of the best kindergarten teachers I have ever seen!"

Cathy's educational background includes a Bachelor of Education degree in Elementary Education from the University of Alberta. Over the years since she obtained her undergraduate degree, Cathy has been actively involved in ongoing professional development engaging in numerous summer institutes and workshops directed at such topics as cooperative learning, literacy and reading, animated literacy, and computers in the classroom.

Cathy believes that children need to learn through play with other children. She uses play activities to teach literacy, numeracy, and socialization skills. Cathy felt that children learn to solve problems and develop their language through play. Furthermore, as children interact with each other through play they experience social and emotional growth. Cathy shared that self confidence is built when children have opportunities to develop relationships with adults and with peers who care about them. Self confidence is further bolstered through the development of literacy skills.

The Eagle Elementary teacher. Jackie (a pseudonym) had taught at Eagle Elementary school for three years. At the time of the interview, she had taught for a total of nine years in the present district. This was Jackie's second year teaching at the kindergarten level. Previously Jackie had taught grades one, two, and three. Jackie was described by her principal as "outstanding!"

Jackie's educational background includes a Bachelor of Education degree in Elementary Education from the University of Alberta. Over the years since she obtained her undergraduate degree, Jackie has been actively involved in ongoing professional development. Most recently Jackie has participated in workshops focusing on kindergarten and grade one level issues. She was particularly excited about the role of balanced literacy in the kindergarten experience.

Jackie believes that children learn through play with other children – it is a socialization process. Appropriate social skills are seen as fundamental for learning to take place. In addition to completing the recommended Alberta kindergarten curriculum, Jackie seeks to achieve three basic goals with her kindergarten class, students are expected to: (a) learn social skills, (b) develop a positive attitude toward school and learning, and (c) view themselves as "very capable learners."

The Hawk Elementary teachers. Two kindergarten teachers, Sue and Brenda (both pseudonyms), from Hawk elementary school participated in the present study. Sue had a total of 19 years of teaching experience, 5 years of which were at Hawk Elementary School. Much of her teaching career has focused on kindergarten instruction. Sue's Bachelor of Education degree and her Diploma in Early Childhood Education were both earned at the University of Alberta. Sue described an extensive list of professional development activities that she had participated in during the last two years, including: (a) completing a graduate course in "reading recovery," (b) ongoing participation in a reading recovery teacher support group, (c) participating in the district's Technology Incentive Program, (d) participating in balanced math and social studies workshops, (d) attending an "Early Childhood" conference, and (e) attending several inservices for children with autism. Brenda had a total of three years of teaching experience, much of this experience came as a substitute teacher in the district. Brenda had been teaching at Hawk Elementary School for six months at the time of the interview. The University of Alberta also awarded her Bachelor of Education degree, which had an Educational Psychology focus. Brenda also described a comprehensive list of professional development activities she had participated in since being hired as a full-time staff member, including: (a) participation in the district's "New Teacher Institute," (b) attending health curriculum inservices, and (c) participating in the district's Balanced Literacy program.

Sue and Brenda saw their relationship to each other in the school as a mentoring one. Planning by Sue and Brenda, for each of their classes, was conducted jointly. Philosophically, Sue and Brenda held many of the same values with respect to teaching and learning. Both believed that academics (e.g., literacy and numeracy) and social growth (e.g., developing friendships, having respect for one-another, being good to one-another, being able to resolve conflicts) were of crucial importance in kindergarten. Both Sue and Brenda were emphatic that: (a) they both desired to promote excitement about learning in their students, (b) the kindergarten students needed to be given the best experience possible to start them on their path as life-long learners, (c) the learning environment in their classrooms was safe so that students could learn to take educational risks, and (d) they needed to teach their students that "tasks that are started need

to be finished." Sue shared, and Brenda supported whole-heartedly, that kindergarten is the place to teach students to believe in their abilities as learners. Sue and Brenda both agreed that it was very important to give young children positive messages to young children regarding what school is about. They argued that part of their role is to ensure that children are comfortable with school and that they feel safe academically and physically while they are at school.

Both teachers wanted children to love school. They gauged their success on this issue by seeing if the children "are wishing that when it's Saturday, that they could be at school." Most importantly, they shared, they "want kids to have good memories about what happened to them in kindergarten." To accomplish this, Sue shared that she asked herself,

> Am I doing the job in the classroom that's making the difference for them. Are they . . . you know how when children get really excited about something they almost vibrate. Their eyes sort of light up. I think it's those kinds of things that are really important to me. It's looking for that kind of reaction from kids. But it's also looking for that kind of reaction from parents.

Sue and Brenda shared that if parents were comfortable with the teachers of their children and what was happening in the classroom that they would be more likely to support classroom learning in the home. This public relations function was accomplished by students sharing, or retelling, what they had learned to their parents. The retelling also served to reinforce student learning.

On the topic of the role of "play," again, Sue and Brenda were in agreement. They articulated that play is typically used in the classroom as the basis for learning. Furthermore, both teachers pointed out that play outside of the classroom serves to reinforce what is learned in the class and that what is learned by one child is often transferred to other children through play. Sue shared that success in the classroom can often be judged by how well lesson content manifests itself in children's play.

Quantitative Comparisons of the Full-day and Half-day Programs

Data from the full-day kindergarten program at Eagle Elementary School and Falcon Elementary School and the half-day kindergarten program at Hawk Elementary School – the independent variable – were compared using six ANCOVAs corresponding to each of Clay's (1993) Observation Sub-Scales and Clay's composite scale: (a) Letter Identification, (b) Concepts About Print, (c) Word Tests, (d) Writing Vocabulary, (e) Hearing and Recording Sounds in Words, and (f) Book Reading Level. Post-test data – the dependent variable – collected from students in both kindergarten classes in the second week of June, 2000 were adjusted using the pre-test data – the covariate – collected in the first week of October, 1999 to adjust for differences in children's prior literacy abilities. Two additional variables were used to adjust the post-test data, these were gender and age (as measured in days on January 1, 2000). Means and standard deviations on the six Clay's sub-tests for the pre- and post-test data collected from the full-day and the half-day kindergarten program pupils are shown in table 1. With the exception of the half the data collected from one child in the half-day kindergarten program which were beyond +3 standard deviations from the mean, all of the data appear normal and free of outliers. The child for whom outliers appear was also found to be 8.6 months older than the average for his peers in the study. Conducting all of the statistical tests with this child's data eliminated from the data file yielded identical conclusions. Consequently, all statistical tests reported in this paper include the outlier data collected. On each post-test item shown in table 1,

we conducted ANCOVAs to determine if differences existed between the full-day and the half-day programs after adjusting for prior knowledge.

Table 1. Clay's Observation Sub-scales Pre-test and post-test data for full-day and half-day kindergarten

	Group Composition			
	Full-day Kindergarten		Half-day Kindergarten	
Clay's Observational Sub-scale	*M*	*(SD)*	*M*	*(SD)*
Pre-test observations (covariate)				
Letter identification	23.04	15.60	33.83	17.11
Concepts about print	7.36	4.01	12.00	3.73
Ready to Read Word test	0.43	0.50	0.86	1.54
Writing	1.04	1.00	3.86	4.08
Hearing & recording sounds in words	1.39	2.53	6.11	8.02
Book Reading Level	0.00	0.00	0.17	0.75
Post-test observations				
Letter identification	50.64	6.00	46.89	9.91
Concepts about print	16.68	3.42	16.17	3.50
Ready to Read Word test	5.96	4.69	3.89	4.92
Writing	13.93	8.82	12.91	10.51
Hearing & recording sounds in words	23.11	10.13	18.14	11.31
Book Reading Level	1.86	2.88	1.86	3.27

Letter identification. After taking into account students' prior letter recognition abilities, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 18.098$, $p = 0.000$). Table 2 provides the analysis of covariance table for this comparison. The results of the ANCOVA suggest that student gender ($F_{1,58} = 9.518$, $p = 0.003$) and initial ability identifying letters ($F_{1,58} = 29.711$, $p = 0.000$), as covariates, play a significant role in the early development of children's abilities to recognize letters.

Table 2. ANCOVA comparing full-day and half-day kindergarten on letter identification.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariates – pre-test, letter ID	1105.653	1	1105.653	29.711	0.000
– gender	354.204	1	354.204	9.518	0.003
– age	15.172	1	15.172	0.408	0.526
Main Effects – Program	673.472	1	673.472	18.098	0.000
Residual	2158.383	58	37.214		
Total	4529.556	62	73.057		

Concepts about print. After taking into account students' prior concepts about print abilities, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 18.314$, $p = 0.000$). Table 3 provides the analysis of covariance table for this comparison. Although not conclusive, the results of the ANCOVA suggest that student gender, as a covariate, may play a significant role in the early development of children's concepts about print ($F_{1,58} = 3.179$, $p = 0.080$).

Table 3. ANCOVA comparing full-day and half-day kindergarten on concepts about print.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, concepts about print	170.794	1	170.794	25.771	0.000
– gender	21.066	1	21.066	3.179	0.080
– age	14.941	1	14.941	2.254	0.139
Main Effects – Program	121.373	1	121.373	18.314	0.000
Residual	384.39	58	6.627		
Total	737.079	62	11.888		

Ready to Read Word test. After taking into account students' prior word reading abilities, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 4.970$, $p = 0.030$). Table 4 provides the analysis of covariance table for this comparison. The results of this ANCOVA also suggest that children's readiness to read words prior to entering kindergarten plays a major role in their readiness to read words at the end of the school year.

Table 4. ANCOVA comparing full-day and half-day kindergarten on the Ready to Read Word test.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, Ready to Read Word test	208.289	1	208.289	10.480	0.002
– gender	24.539	1	24.539	1.235	0.271
– age	9.073	1	9.073	0.456	0.502
Main Effects – Program	98.778	1	98.778	4.970	0.030
Residual	1152.795	58	19.876		
Total	1485.714	62	23.963		

Writing. After taking into account students' prior writing abilities, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 11.671$, $p = 0.001$). Table 5 provides the analysis of covariance table for this comparison. The results of the ANCOVA suggest that student gender ($F_{1,58} = 8.973$, $p = 0.004$) and writing ability entering kindergarten ($F_{1,58} = 45.690$, $p = 0.000$), as covariates, play a significant role in the early development of children's understandings of writing and their abilities to write.

Table 5. ANCOVA comparing full-day and half-day kindergarten on writing.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, writing	2157.591	1	2157.591	45.690	0.000
– gender	423.739	1	423.739	8.973	0.004
– age	12.645	1	12.645	0.268	0.607
Main Effects – Program	551.124	1	551.124	11.671	0.001
Residual	2738.917	58	47.223		
Total	5870.603	62	94.687		

Hearing and recording sounds in words. After taking into account students' prior abilities for hearing and recording sounds in words, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 18.723$, $p = 0.000$). Table 6 provides the analysis of covariance table for this comparison. The results of the ANCOVA suggest that student gender ($F_{1,58} = 12.206$, $p = 0.001$) and skill to hear and record sounds in words prior to entering kindergarten, as covariates, play a significant role in the early development of children's abilities to hear and record sounds in words.

Table 6. ANCOVA comparing full-day and half-day kindergarten on hearing and recording sounds in words.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, hearing & recording sounds in words	2015.613	1	2015.613	31.868	0.000
– gender	772.047	1	772.047	12.206	0.001
– age	25.116	1	25.116	0.397	0.531
Main Effects – Program	1184.221	1	1184.221	18.723	0.000
Residual	3668.471	58	63.250		
Total	7506.317	62	121.070		

Book Reading Level. After taking into account students' prior book reading abilities, gender, and age, significant differences (alpha = 0.05) were found to exist between the full-day kindergarten program and the half-day kindergarten program ($F_{1,58} = 5.073$, $p = 0.001$). Table 7 provides the analysis of covariance table for this comparison. The results of the ANCOVA suggest that the differences in program between full-day and half-day kindergarten play a significant role in the early development of children's abilities to actually read.

Table 7. ANCOVA comparing full-day and half-day kindergarten on book reading level.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, book reading level	180.193	1	180.193	1.786	0.187
– gender	15.247	1	15.247	0.151	0.699
– age	355.509	1	355.509	3.524	0.066
Main Effects – Program	1142.745	1	1142.745	5.073	0.001
Residual	5850.833	58	100.876		
Total	7897.746	62	127.383		

Discussion

In this preliminary investigation we explored the perceived and actual effects of full-day kindergarten. It was clear that both the half-day and the full-day kindergarten programs were generally in keeping with the six principles exhibited by exemplary programs (Corter & Park, 1993). Instruction in both programs was approached from a play-based child-centred philosophy. It was clear from the teacher interviews that instruction in both programs focussed not only on academics, but on the development of the whole child – socially, emotionally, and academically. Instruction in both programs emphasized the role of the learner in his or her social context. Pupils were sensitized regarding how they fit into their social and physical world. School administration at all three participating schools were extremely supportive of their kindergarten programs. All three, very experienced, principals were sure that they had "outstanding" kindergarten teachers in their programs. Given the inner city settings of schools offering full-day kindergarten programs, parental support for pupil learning in the home was noted as not exemplary. Teachers and the administrator of Hawk Elementary School, offering half-day kindergarten programming, were more optimistic about the level of parental support for pupil learning in the home. We suspect that since all teachers were of the highest calibre and all were following the recommended Alberta curriculum of studies for kindergarten that the programs were both structured and balanced to best meet the needs of their pupils. Corter and Park's (1993) sixth principle exhibited by exemplary kindergarten programs is the only one in which we

suspect existed a large discrepancy between the full-day and the half-day kindergarten programs in the province of Alberta: schools and society in general should provide support for kindergarten. This, of course, is the subject of this investigation. In addition to the support provided generally by schools and society to all kindergarten programs, Falcon Elementary School had the distinct advantage of the support of an anonymous benefactor. Eagle Elementary School was not as fortunate as Falcon, although the full-day program was funded by donations made by various community groups and by a "high needs allocation" grant from the district.

Interview Data: Falcon, Eagle, and Hawk Elementary Schools

Teachers at all three schools underscored their emphases in teaching kindergarten age children as focussing on (a) play and problem solving, (b) language and literacy, and (c) social-emotional growth through interaction with their peers and their teacher.

Clay's Observation Survey Data: Falcon, Eagle, and Hawk Elementary Schools

In terms of growth in language and literacy, the findings of the present study are consistent with the literature (e.g., Alber-Kelsay, 1998; Ohio State Legislative Office of Education Oversight, 1997). It was clear that pupils in the full-day kindergarten program performed significantly better, after taking into account previous ability, age, and gender, on all of Clay's Observation Sub-tests: (a) letter identification, (b) concepts about print, (c) readiness to read word test, (d) writing vocabulary, (e) hearing and recording sounds in words, and most importantly (f) book reading level. The analyses conducted in this study suggest that student gender, with female students outperforming their male counterparts, play a significant role in the acquisition of skills enabling them to (a) identify letters from the alphabet ($F_{1,58} = 9.518$, $p = 0.003$), (b) write ($F_{1,58} = 8.973$, $p = 0.004$), and (c) hear and record sounds in words ($F_{1,58} = 12.206$, $p = 0.001$).

Given the significant differences found on all five of Clay's observational sub-tests, it is not surprising that the inferential test (ANCOVA) performed on Clay's Book Reading Level should be significant ($F_{1,58} = 5.073$, $p = 0.001$). In other words, actual reading ability of pupils was attributed to differences between being in a full-day kindergarten program and being in a half-day kindergarten program after accounting for the effects of student age, gender, and reading ability upon entering kindergarten. Interestingly, although the five sub-tests from Clay's Observation survey were all influenced by children's abilities prior to entering kindergarten and four of the five were also affected by the gender of the child, book reading ability was not. The significant difference between the full-day program kindergarten children and the half-day program kindergarten children with respect to their book reading ability needs to be viewed with caution as the actual book reading levels between the full-day and the half-day kindergarten program children were the same at the end of the school year. However, given the higher socio-economic status of the community from which the half-day kindergarten children came when compared to the socio-economic status of the full-day kindergarten students' community, the fact that the full-day kindergarten children were able to perform as well as the half-day program children by the end of the school year is an accomplishment in itself.

Conclusions and Recommendations

Four conclusions present themselves from the findings obtained in this study. From these conclusions emerge five recommendations for further research and policy.

1. Children in the full-day kindergarten program experienced significantly greater growth in the pre-requisite skills for reading than did children in the half-day kindergarten program. This is particularly true in terms of the development of skills enabling pupils to (a) identify letters of the alphabet, (b) develop understandings of the conventions regarding printed language, (c) assemble a repertoire of words necessary to become readers, (d) correctly sequence letters to form words from memory, and (e) move from oral language to printed language by being able to record sounds using letters. Overall the children in the full-day kindergarten program also demonstrated growth in the actual ability to read to be greater given where they started.

2. In keeping with the literature and the anecdotal evidence gathered in this research, it appears that using "play" as the basis for delivering instruction to kindergarten students is highly effective.

3. It is clear that the full-day kindergarten experience enabled pupils of low socioeconomic or educationally disadvantaged backgrounds to catch up to and, in almost all cases, exceed the skills pre-requisite to reading acquired by pupils of higher socioeconomic or of educationally more advantaged backgrounds. This appears to be the result of the teacher taking on the role of providing necessary experiences to socialize and educate pupils that may not be as readily available in the home environment of pupils coming from low socioeconomic or educationally disadvantaged backgrounds.

4. The funding provided by Falcon school's benefactor and Eagle Elementary School's various charity groups was essential in establishing a full-day kindergarten program – without this funding, the full-day programs would not have existed. The additional funding was necessary for (a) purchasing various resource materials and equipment for the classroom, (b) hiring a half-time teaching assistant, and (c) topping off the teacher's salary to enable her to be in the classroom on a full-time basis.

Given the four conclusions above we recommend that:

1. To overcome many of the issues of validity of the present research, a study enquiring into the differences between full-day kindergarten and half-day kindergarten should be implemented over the course of an entire school year using an experimental design with a minimum of 30 schools located within the province of Alberta. This will also provide a much-needed data to ascertain the applicability of American and International research literature in the Alberta context.

2. Further research investigating student growth during their kindergarten year should, as was the case in the present study, make use of data collected before the end of the first

month of the school year to establish a base line for comparing end-of-year growth data collected during the final month of the school year.

3. A second study should be put into place to study the long-term effects of full-day kindergarten. Such a study should follow pupils who have participated in full-day kindergarten through to the end of their elementary school experience. The main difficulty to overcome in conducting such a study is that the pupils who likely will benefit the most from the experience of full-day kindergarten tend to belong to families have high levels of transiency.

4. The means for delivering instruction in kindergarten should continue to be "play based" (see Corter & Park, 1993). Pupils need to continue to learn in ways that fit with the manner in which children learn naturally. Play is the means by which children learn about the world around themselves, this needs to continue to be the focus of learning in kindergarten programs.

5. Full-day kindergarten should be made available immediately in schools serving pupils coming from predominately low socioeconomic or educationally disadvantaged backgrounds. It appears that pupils coming from these sorts of social or economic conditions may have the most to gain in order to be prepared to learn to read. Although the findings from the study reported on in this paper are not conclusive, they are sufficient – given the gains in the development of students' abilities to (a) identify letters of the alphabet, (b) understanding the conventions regarding printed language, (c) assemble a repertoire of words necessary to become readers, (d) correctly sequence letters to form words from memory, and (e) move from oral language to printed language by being able to recording sounds using letters – to suggest that time is of the essence if as a society we are to provide children with the best possible opportunities for success.

6. Because education is a concern of our entire society, we should – as a society – take responsibility for funding full-day kindergarten programs, particularly for schools serving socially and educationally disadvantaged communities. At Falcon School this role was taken on during the 1999/2000 school year by an anonymous benefactor. While at Eagle Elementary School the role was taken on by various charity groups who chose to donate to the school. Other high needs schools have not been so lucky. The element of luck should not be the deciding factor in whether full-day kindergarten funding is provided to a school in need – the Government of Alberta should continue to examine possible means for providing additional funding to schools for the implementation of full-day kindergarten programs.

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